Rocky Mountain Wolf
and Its Habitat

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and
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Introduction

This publication has been developed as an attempt to review and summarize the existing information on the Rocky Mountain wolf (*Canis lupus irremotus*). Specifically, it is directed toward reviewing the historical distribution, present status and habitat relationships of the species. Our literature search and personal communications with persons knowledgeable about the Rocky Mountain wolf lead us to conclude that too little was learned and recorded about the species before it reached its present low population level. Too often, we have had to rely upon sketchy "popular" literature and recent "sightings" to reconstruct the boundaries of its historic and present range, its present status, and its habitat. Thus, we have attempted to summarize what is known, and hope it will be useful in making land use decisions related to the wolf, and will show where additional research is needed.

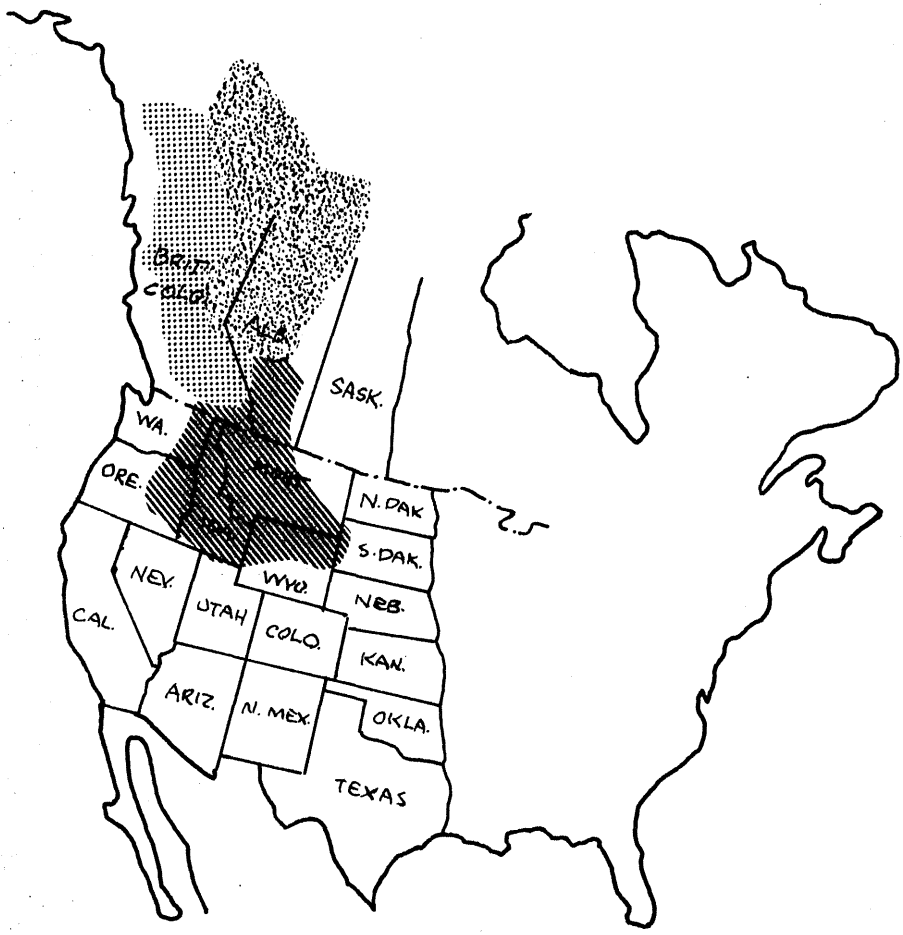
Historical Perspective

Prior to 1900 wolves roamed over vast areas of the Great Plains and forests of North America. Wolf densities may have approached one every 3.5 square miles but pressure by government and private trappers soon claimed over 200,000 pelts per year (Aulerich 1964). Gurnow (1969) stated that several hundred thousand wolves flourished with the extensive buffalo herds prior to 1880, relying upon buffalo as their main prey item. With the drastic decline in buffalo after 1880 wolves changed their diets to include other large ungulate species, along with domestic livestock which were by then available. By the early 1900's stockmen conducted extensive wolf drives and

trapping campaigns which decimated the Western wolf populations. In the Sweet Grass Hills of northern Montana approximately 1000 wolves were poisoned each winter (Singer 1975a). Agricultural and ranching development in remote western areas encouraged still further poisoning and killing programs. By 1910 only three to four packs inhabited Glacier National Park and by 1918 less than 3000 wolves were believed to inhabit lands west of the 100th meridian (Seton 1929).

As many as twenty-three wolf subspecies have been identified in North America. The Rocky Mountain Wolf (Canis lupus irremotus) inhabited Idaho, northern Wyoming, south and western Montana, eastern Washington and Oregon and southern Alberta (Hall and Kelson 1959). Two other subspecies also inhabited areas which might overlap with C. l. irremotus. These were C.l. columbianus, the British Columbia wolf which occupied most of British Columbia excluding coastal areas, and C.l. occidentalis which inhabited the north and central parts of Saskatchewan (see Figure 1). In 1944 a wolf was shot near Waterton Lakes National Park on the U.S.--Canadian border with characteristics of C.l. irremotus and C.l. occidentalis, and in 1941 a C.l. occidentalis was killed in Gallatin County, Montana. Although Hall and Kelson (1959) delineated distinct boundaries for each subspecies in North America, occasional lone wolves or packs may be found in areas other than their respective distributional limits. Determining subspecific identification and distribution remains a problem today.

It has been hypothesized that C.l. occidentalis moved south and replaced C.l. irremotus in northwestern Montana. Seven subspecies of the North American wolf have been verified as being extinct but some doubt still remains as to the actual extinction of C.l. irremotus. Occasional sightings of wolves in remote areas of northwestern Montana may represent either of the



Canis lupus irremotus

C.l. occidentalis

C.l. Columbianus

Figure 1. Historic range of the Rocky Mountain wolf (Canis lupus irremotus) and two associated subspecies (redrawn from Hall and Kelson 1959)

above mentioned subspecies or a hybrid cross between them. Generally, the British Columbia Wolf was larger and darker in color than the Rocky Mountain Wolf but actual subspecific identification must rely upon skull and other body measurements. Without being able to measure a wolf, it would prove very difficult to absolutely verify whether or not it was one or the other subspecies.

As of 1939 the following wolf populations were estimated to be present in the national forests of Montana and Idaho (Aulerich 1964):

Deerlodge National Forest	12
Flathead National Forest	2
Bitterroot National Forest	1
Cabinet National Forest	1
Gallatin National Forest	3
Kootenai National Forest	1
Lewis and Clark National Forest	7
Lolo National Forest	1
Boise National Forest	6
Challis National Forest	10
Coeur d'Alene National Forest	2
Nez Perce National Forest	10
Salmon National Forest	5
Targhee National Forest	10
Weiser National Forest	5

Singer (1975b) presented the following information for wolves in Glacier National Park:

	# Shot	# Trapped	# Observations
1910-1919	1	2	7
1920-1929	3	8	7
1930-1939	1	-	17
1940-1949	2	1	21
1950-1959	10	4	18
1960-1969	-	-	12
1970-1975	-	-	16
	17	15	98

Cole (1971) stated that from 1930 to 1971, 230 wolf observations of 358 animals were recorded for Yellowstone National Park.

The major problem with many observations of wolves is the reliability of the observer to correctly identify the animal as a wolf rather than a dog

or coyote. The above statistics present the most reliable data available and are considered to be representative of the potential populations of wolves in the Northwest. Further updated statistics are presented in the section entitled Present Distribution and Status.

As of 1973, C.l. irremotus was considered an endangered species under the federal Endangered Species Act. One problem in protecting the Rocky Mountain wolf prior to this act was the possible movements of wolves outside their distributional limits, thus making them available for hunting or trapping, at the discretion of the state where they may be found. Before the Endangered Species Act was enacted individual states regulated their own hunting laws on all animals and the wolf was considered by many to be a predatory animal which could be shot at any time. Montana, Wyoming, Idaho and Oregon all allowed year-round hunting of wolves, while Washington was the only state in the Northwest to provide legal protection. Since 1973 Montana state law has also been changed to protect wolves, but as of 1975 Wyoming still offered a $2.00 bounty on dead wolves and Idaho considered the wolf a predatory animal. However, the federal Endangered Species Act supercedes all state laws.

Present Distribution and Status

The actual number of wolves presently inhabiting the northern Rocky Mountain region of the United States is unknown. However, rough estimates can be made through observations by reliable sources of tracks, howls, and visual sightings. A recent publication by Baumstead (1970) provided the following estimates:

Colville National Forest	2
Flathead National Forest	15
Helena National Forest	5
Kootenai National Forest	3
Shoshone National Forest	7

Singer (1975a) presented a map of wolf observations and known trapping sites for Glacier National Park from 1910 to 1975. Fifty-four observations were made from 1910-1959, while 24 observations were made from 1960-1975. Additionally, 10 known locations of wolf mortalities were recorded. The observations were mostly centered around the North Fork of the Flathead River.

Rocky Mountain wolf sightings or possible sightings for the Northwest are sumamrized in Table 1.

Habitat Relationships

The Rocky Mountain wolf is a wide-ranging species, often moving at a trot or run for long periods covering up to 45 miles a day (Burkholder 1959). They apparently need a large territory which may encompass vastly different types of vegetation and terrain. Norell (pers. com.)stated that "a wolf pack is believed to need 100 square miles of primitive type habitat to exist." Flath (pers. com.) estimated the average territory size to be 75-150 square miles, being smaller in winter when prey species are concentrated on winter ranges. Perhaps the major requirement in a habitat is the availability of a large remote area relatively free from people and their disturbances.

Ruediger (pers. com.) stated that "almost nothing is known as to what constitutes wolf habitat; however, it is fairly certain that they are dependent on substantial ungulate populations." Wolves have been known to follow elk herds to their high summer pastures and return with them to their winter ranges in Yellowstone National Park (Arnold 1937). Aulerich (1964) stated that wolves are dependent upon big game and perhaps livestock.

Curnow (1969) listed the food of wolves as rabbits, moose, elk, caribou, antelope, deer, buffalo, mountain sheep, goats, beaver, ducks, geese, pheasants, black bears, grizzly bears, cattle, domestic sheep and horses. Records

Table 1. Summary of Rocky Mountain Wolf Sightings in the Northwest United States and Canada.

State	Reference	Location	Date	Comments
Washington	Robert Wasem (pers. com.)	North Cascades National Park	1967	A black phase wolf seen near Park Creek Pass, Chelan County.
			1970	Wolf howling on South Fork of Bridge Creek, Chelan County.
			1972	Wolf howling along Little Beaver Creek, Skagit County.
			1972	Wolf observed at Willow Lake, Skagit County
			1972	Wolf observed at Hozomeem Campground, Skagit County.
	Thomas E. Burke (pers. com.)	Barnaby Creek Ferry County	1974	Hunter claimed to have shot a wolf.
Idaho	Donald R. Jenni (pers. com.)	Clearwater National Forest	1971-1975	Several wolf sightings.
	Dick Norell (pers. com.)	Soda Springs	1919	Wolf killed.
		Near Murray near Id-Mt. state line	1962	Wolf shot.
		Chamberlain Basin	1965	Wolf observed.
		Hoodoo Lake Area	1968	Two wolves reported.
		Cascade Reservoir	1970	Wolf observed, believed to be one of a mated pair with young in vicinity.
		Hand Meadows	1970	Tracks observed.
		Little Soldier Lookout, Jackass Flat & vicinity	1971	Two wolves reported.
		Boundary County	1972	Wolf observed.
		Between King Hill and Mountain Home	1973	Two wolves observed near highway.
Wyoming	Marty Stouffer (unpubl. memo)	Near Togwotee Pass on Highway 287	1973	Wolf observed.
	McGarvey (1974)	Shoshone Natl. For. Teton Natl. Park	1974	Estimate of about 20 wolves.

Table 1 cont.

State	Reference	Location	Date	Comments
Wyoming cont.	Cole (1969)	Yellowstone Natl. Park & vicinity	1930's -1969	69 observations of 105 wolves.
Montana	Dwight Cook (pers. com.)	Horse Prairie-Beaverhead Natl. Forest	Early 1970's	Pair of wolf tracks observed.
		Wall Creek near Ennis	--	Sightings of wolves.
	John Grove (pers. com.)	Lincoln-Scapegoat Wilderness Area	1971-1975	Wolf tracks have been observed at several locations, and howls have been heard.
	Roger Evans (pers. com.)	Lewis & Clark Natl. Forest	Recent Years	Several observations of animals and tracks.
	John H. Ormiston (pers. com.)	Selway-Bitterroot Wilderness	--	Unconfirmed and widely scattered sightings of wolves.
	William Ruediger (pers. com.)	Kootenai Natl. For. (specifically in the Whitefish Range and Yaak River drainage areas)	--	Various wolf sightings. Wolf trapped and killed near Eureka in 1974.
	Jim Roscoe (pers. com.)	Gravelly Range	1975	Pair of adult wolves sighted.
	Flath (1975)	Lincoln & Flathead Counties, Sun River area, Gravelly Range adjacent to Yellowstone Park, & Valley County north of Glasgow.	--	Numerous wolf tracks and sightings reported.
	Singer (1975a)	Middle Fork Flathead River	1973-1975	12 reports of wolves

Table 1 cont.

State	Reference	Location	Date	Comments
Montana cont.	Singer (1975b)	Glacier Natl. Park & Waterton Lakes Natl. Park	--	There are presently 10-20 wolves in this region.
	Nowak (1974)	Western Motnana	1965-1972	16-33 wolves present
Canada	Singer (1975a)	Banff Natl. Park	1969	15-20 wolves
		Jasper Natl. Park	1969	48 wolves

reveal that wolves in Glacier National Park have been known to kill eight white-tailed deer, three moose, one elk, one beaver and several snowshoe hares. In addition, wolves in the pack have been observed chasing elk twice, mountain sheep once, cattle once, and inspecting beaver houses on five occasions (Singer 1975a).

Flath (pers. com.) stated that wolves den in well-drained soils. Curnow (1969) reported that dens must be near water, and are usually on a high rocky ridge overlooking a stream or lake. He further stated that they prefer to den near grassy meadows where they can hunt rodents. Cowan (1947) found that wolves were found to timberline and usually located their dens in timbered areas with well-drained soils.

Information from Isle Royal showed that wolves there averaged 9.7-13.9 pounds of food consumption daily along with about one-half gallon of water (Mech 1966, 1970).

The habitat of wolves may be "much the same as (that of the) coyote, embracing grassland reaches and mixed wood forest from the lowest valleys to the uplands during the summer months " (Soper 1973).

The above review of the habitat relationships of the Rocky Mountain wolf provide only a limited insight into its habitat requirements. Certainly, the wolf must have a ready source of prey; a large, rather remote region within which to establish a territory; and protection from extermination by hunting, trapping and poisons. The limited information on wolf habitat prevents the presentation of a comprehensive list of habitat requirements or components. The conceptual model of wolf habitat presented in Figure 2 is derived from the limited amount of existing knowledge and should be tested and expanded or modified as additional information is obtained.

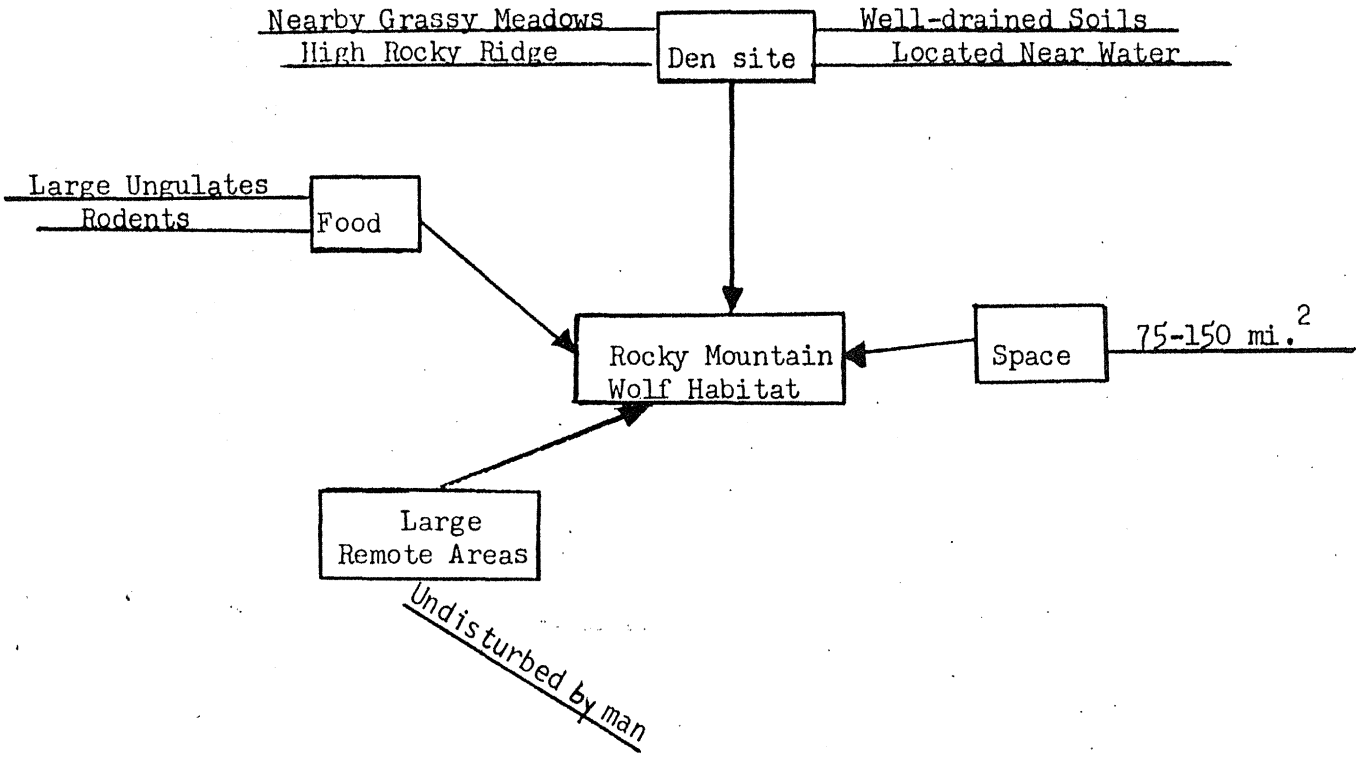


Figure 2. Conceptual Model of Rocky Mountain Wolf Habitat

Future Outlook

Although the Rocky Mountain Wolf is protected from hunting and trapping by the Endangered Species Act of 1973 they may well experience further if not already extinction due to the critical loss of habitat. The Cabin Creek coal development on the Montana-Canada border has already been cited as a possible disruptive influence due to its close proximity to a known denning and wolf activity center (Singer 1975b). Well-defined habitat requirements other than vast areas of undeveloped land containing a variety of prey for year-round occupancy still remain uncertain. The limited number of verified observations usually only contain information concerning brief glimpses of animals or tracks with very little detailed analysis of the surrounding habitat. National parks, national forests and wilderness areas remain the most likely areas for wolf packs or lone wolves to inhabit. In addition to the need for remote areas away from human activity centers a wolf pack must also establish a balance with its associated carnivores such as coyotes, grizzlies and mountain lions for the available prey. Singer (1975a) has noted some problem in Glacier National Park with the inability of wolves to compete for space and food with these other carnivores. From this brief review a definite need for further study and evaluation of the Rocky Mountain wolf seems required both as to its habitat requirements and actual distribution throughout the northern Rocky Mountains.

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